CLAIM AMENDMENT

Please amend the claims as follows:

1. (Original): An ophthalmic adaptive-optics instrument for obtaining patient-verified prescription of low and high-order aberrations, comprising:

an observation target disposed for a subject eye to fixate upon;

an aberration-compensating element disposed in the observation path of said subject eye, wherein said aberration-compensating element is driven by a control signal and is capable of compensating low and high-order aberrations of said subject eye;

a wavefront-sensing device sensing the aberration of said subject eye via said aberration-compensating element;

processing electronics coupled to said wavefront-sensing device and accepting a command signal to generate said control signal to drive said aberration-compensating element; and

subjective feedback control means enabling the patient to actively produce said command signal to adjust said aberration-compensating element and to verify the amount of aberration compensation for optimal visual acuity;

wherein said ophthalmic adaptive-optics instrument can measure the total aberration of said subject eye, corresponding to a null command signal, and the residual aberration for optimal visual acuity, corresponding to a command signal for optimal visual acuity; and

wherein said ophthalmic adaptive-optics instrument provides, by subtracting said residual aberration from said total aberration, said patient-verified prescription of low-and-high order aberrations.

2. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said aberration-compensating element is a deformable mirror.

3. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said aberration-compensating element consists of a deformable mirror and a set of compensation lenses.

4. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said aberration-compensating element is a spatial phase modulator.

5. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said wavefront-sensing device is a Hartmann-Shack wavefront sensor.

6. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said wavefront-sensing device is a curvature wavefront sensor.

7. (Original): A method for obtaining patient-verified prescriptions of low and high-order aberrations, comprising the steps of:

providing an observation target for a subject eye to fixate;

providing an aberration-compensating element disposed in the observation path of said subject eye, wherein said aberration-compensating element is driven by a control signal and is capable to compensate low and high order aberrations of said subject eye;

providing a wavefront-sensing device to sense the aberration of said subject eye via said aberration-compensating element;

providing processing electronics coupled to said wavefront-sensing device and read in a command signal;

generating said control signal to drive said aberration-compensating element;

providing subjective feedback control means to enable the patient actively to produce said command signal to adjust said aberration-compensating element and to verify the amount of aberration compensation for optimal visual acuity;

measuring the total aberration of said subject eye, corresponding to a null command signal;

measuring the residual aberration for optimal visual acuity, corresponding to a command signal for optimal visual acuity; and

determining said patient-verified prescription of low-and-high order aberration by subtracting said residual aberration from said total aberration.

8. (Current amended): ~~A surgical station for customized corneal ablation using a patient-verified prescription of low-and-high-order aberration~~, An ophthalmic adaptive-optics instrument of claim 1, further comprising:

~~An ophthalmic adaptive-optics instrument providing a patient-verified prescription of low and high-order aberrations, wherein said patient-verified prescription indicates the amount of aberration correction needed for optimal visual acuity of the subject eye;~~

a system computer connected operationally to said ~~ophthalmic adaptive-optics instrument~~ processing electronics and calculating an ablation profile in accordance with said patient-verified prescription; and

a surgical laser system producing a surgical laser beam and having a beam scanning mechanism to scan said surgical laser beam in a controllable fashion;

wherein said system computer scans said surgical laser beam of said surgical laser system to produce a customized ablation profile on the cornea of said subject eye to achieve aberration correction in accordance with said patient-verified prescription.

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Current amended) An ophthalmic adaptive-optics instrument of ~~A surgical system as in~~ claim 8, wherein said surgical laser system includes an excimer laser operating at a wavelength of 193 nm.

15. (Current amended) An ophthalmic adaptive-optics instrument of ~~A surgical system as in~~ claim 8, wherein said surgical laser system includes a solid state UV laser operating at a wavelength around 210 nm.

16. (Current amended) An ophthalmic adaptive-optics instrument of ~~A surgical system as in~~ claim 8, wherein said surgical laser system includes a solid state UV laser operated at a pulse rate between 200 to 2000 Hz.

17. (Current amended) An ophthalmic adaptive-optics instrument of ~~A surgical system as in~~ claim 8, wherein said surgical laser system includes an eye-tracking device.

18. (Current amended): ~~A method for custom lens making, comprising the steps of:~~

~~providing an ophthalmic adaptive-optics instrument to produce patient-verified prescription of low-and-high order aberrations, wherein said patient-verified prescription indicates aberration correction needed for optimal visual acuity of a subject eye;~~

An ophthalmic adaptive-optics instrument of claim 1, further comprising:

~~providing~~ a system computer connected operationally to said ~~ophthalmic adaptive-optics instrument~~ processing electronics and calculating an ablation profile in accordance with said patient-verified prescription; and

~~providing~~ a lens making station coupled to said system computer;

wherein said system computer guides said lens making station to produce a custom lens that embeds optical correction in accordance with said patient-verified prescription of low and high-order aberrations.

19. (Current amended) An ophthalmic adaptive-optics instrument of ~~A method as in~~ claim 18, wherein said lens making station employs laser ablation to create a custom profile on a surface of said custom lens.

20. (Current amended) An ophthalmic adaptive-optics instrument of ~~A~~

~~method as in~~ claim 18, wherein said custom lens includes custom contact lens, custom eyeglasses, and custom intra-ocular lens.

21. (New) An ophthalmic adaptive-optics instrument of claim 18, wherein said lens making station employs an excimer laser operated at 193nm.

22. (New) An ophthalmic adaptive-optics instrument of claim 18, wherein said custom lens is made of PMMA.

23. (New) An ophthalmic adaptive-optics instrument of claim 1, further comprising:

relay optics relaying wavefront at pupil of said subject eye to said aberration-compensating element.

24. (New) An ophthalmic adaptive-optics instrument of claim 23, wherein said relay optics comprises two or more lenses.

25. (New) An ophthalmic adaptive-optics instrument of claim 23, wherein said relay optics includes a set of compensation lenses to compensate low order aberrations of said subject eye.